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THE ROSS DEPENDENCY IN PICTURES

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THE ROSS DEPENDENCY
IN PICTURES



THE ROSS DEPENDENCY IN PICTURES

by

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INTRODUCTION

THE ROSS DEPENDENCY

If you look at the map of Antarctica in this booklet you will notice, south of New Zealand, a large area shaped something like a triangle but with a curved base line (the sixtieth degree of south latitude). This base line lies about 900 miles south of Stewart Island, and the apex of the "triangle" is at the South Pole, 2,000 miles further south still. This "sector" as it is called is the Ross Dependency.

In 1923 all the "land" part of this sector was handed over by the British Government to New Zealand to administer and the name "the Ross Dependency" was given to it. Since 1956 there has been a permanent year-round New Zealand settlement in the Dependency, Scott Base, and during the Antarctic summers New Zealand surveyors, geologists, and others have explored and mapped almost the whole Dependency, a land area of nearly 175,000 square miles, nearly twice the area of New Zealand itself.

In this little book I have tried to show you in pictures what New Zealand's Ross Dependency looks like, and what it is like to live there.

L. B. QUARTERMAIN.

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GETTING THERE

1

Tough Going for the Pioneers

When Captain Cook in his ships *Resolution* and *Adventure* crossed the Antarctic Circle on 18 January 1773, he and his crews were the first men ever to sail Antarctic waters.

But Cook had only sailed a few miles further south when his little vessels were blocked by pack ice "so thick and close that we could proceed no further. . . . From the mast head I could see nothing to the Southward but Ice."

The first man to sight land in what was to be the Ross Dependency area was John Balleny, a whaling captain. Balleny and his men sailed south from New Zealand on 7 January 1839. The *Eliza Scott* and the tiny, 54-ton cutter, *Sabrina*, reached Antarctic waters late in January, and by this time the pack had broken up so much that Balleny was able to reach 69° S on 1 February. Making his way back, on 9 February he "saw the appearance of land" to the southwest. What he saw was a group of islands lying across the Antarctic Circle, and now called the Balleny Islands. Captain Freeman of the *Sabrina* managed to scramble ashore "up to the middle in water" just north of the Circle.

Then came the man after whom the Ross Sea and Ross Island are named, the British naval officer, James Clark Ross. His ships, *Erebus* and *Terror*, had been specially strengthened for ice navigation, and so when he reached the pack south of New Zealand, on the last day of 1840, Ross was able to smash open a door through which men would at last be able to pass into the heart of the Antarctic. After four days his sturdy ships broke out into an open sea, and a few days later the explorers saw land far ahead, the towering white peaks of the Admiralty Range behind Cape Adare. Ross pressed on to discover the island which now bears his name, the 12,450 ft volcano Mount Erebus, and the mighty wall of ice a hundred feet high and hundreds of miles long which he called the Barrier. Sufficient reward surely for the perilous battle with the ice which his artist has depicted in the drawing you see here.



Erebus and Terror

“A Gale in the Pack, 20th January, 1842.”

Ross, *Voyage to the Southern Seas*. From a drawing by J. E. Davis.

Ross's description of the pack was so uninviting that for over 50 years no one followed where he and his men had led. And when at last in 1894 a “New Australian” from Norway named Bull did make a determined voyage south from Melbourne via New Zealand, it was not his wish to explore the Victoria Land which Ross had found, but to make a fortune by catching the “Right whales” which Ross had said were plentiful. The Right whales were not there to catch, but Bull and some of his men made history by landing – for a few seconds – on the beach near Cape Adare and so became the first men ever to land on the main mass of the Antarctic continent.

A few years later one of the men who was with Bull, C. E. Borchgrevink, led an expedition south in the ship “*Southern Cross*”. They erected two huts on the beach at Cape Adare, and 10 men lived here right through the long winter night, the first men ever to winter – by choice – in the Antarctic. When the ship returned in January 1900, the expedition sailed south to the Barrier, and a few of the men sledged for about 10 miles south over the ice shelf.

It took Ross six weeks to sail from Campbell Island to Ross Island. Now, a little over a hundred years later, the ship you see here is able to steam from New Zealand to Ross Island in about six days.

HMNZS *Endeavour* is an oil tanker loaned to New Zealand by the United States for Antarctic supply work since 1962. She generally makes two voyages to McMurdo Sound each summer carrying supplies for New Zealand parties, fuel oil for the Americans at McMurdo, and a few passengers.

In this picture *Endeavour* is about to berth close to the U.S. McMurdo Base. In the right background is Hut Point, and you can see the big square hut which was erected by Captain Scott's *Discovery* expedition in 1902-04. On the point is Vince's Cross in memory of a sailor of that expedition who lost his life when he fell from the cliffs in a blizzard.





Although the ice pack is no longer the insuperable barrier which turned back Cook and on one occasion held up even Ross for 40 days, it is still no easy job to break through the miles-wide belt of floating ice which lies between New Zealand and the Antarctic until, about January each year, it breaks up and at last leaves only icebergs to make a keen lookout still necessary.

So, during November and at least early December, only powerful icebreakers can smash the 10- or 12-ft-thick ice and drive through to the open sea beyond. Here the USS *Glacier* is doing this, and close in her wake comes New Zealand's *Endeavour* making her way south with vital supplies for the New Zealand team at Scott Base and for New Zealanders exploring the little known country still farther south.

Several explorers' ships have been trapped and crushed in the pack, and even in recent years ships have been rescued only because icebreakers have been rushed to their assistance.

If the sailing ships of Ross's day took six weeks to travel from New Zealand to McMurdo, and the modern ship requires at least six days, here is another form of transport which will get you there in not much over six hours.

Flying from the United States air base at Christchurch International Airport, the huge "Connies" (Constellations) and ski-equipped Hercules can carry stores and men and even heavy equipment like ground vehicles to the Antarctic in a fraction of the time taken by the fastest ships. Most of our New Zealand workers are now taken south on these American aircraft which make frequent flights during the summer months. In 1964 for the first time a flight was made in mid winter, to bring out an American sailor who had been gravely injured at McMurdo.

Here a New Zealand dog team is ready to haul supplies, brought south by aircraft, the remaining few miles to Scott Base.

The aircraft "land" on a runway levelled out by bulldozer on the sea ice off McMurdo or, if the sea ice has broken up, on a more permanent ice runway south of Scott Base, on the Ross Ice Shelf.



THE PLACE

5

Sentinel of the Antarctic



This is a typical tabular or flat-topped iceberg, and most of the bergs you will see on your way south by sea from New Zealand are of this sort. They will vary in size from a few hundred yards to many miles in length.

All these icebergs are portions broken off the Röss Ice Shelf, Ross's "Barrier". This is a vast plain of ice up to 1,000 ft thick filling the southern end of the Ross Sea. It stretches 500 miles south from Ross Island, and east from Ross Island to King Edward VII Land. Every now and then a great chunk of this ice shelf breaks off at the sea edge and floats off as an iceberg. Sometimes over a hundred bergs of all shapes and sizes can be seen at one time.

These bergs are about 100 ft in height above the sea, but you must remember that they go down into the sea for about five times that distance.

Modern navigation aids like radar make icebergs much less a danger than in earlier days, but bergs are always given a wide berth because there is often a "ram" or ledge projecting, unseen, for many feet under the water.

During the winter the sea around the whole of the Antarctic Continent is frozen to a depth of some feet, but when summer comes much of this ice is gradually loosened by the swell, broken up, and floats north to form the pack referred to in Nos. 1 and 3.

McMurdo Sound lies between the western shore of Ross Island and the mainland coast, and in the south meets the permanent Ross Ice Shelf. In this comparatively sheltered area, then, the ice is not broken up so quickly as off the coast and only gradually does the ice edge extend further and further south.

This photograph was taken in early January, looking south from Cape Royds towards Cape Evans. The black peak in the background is Cape Barne. A week earlier the ice completely covered the sea shown in the picture. A week later all the ice had disappeared.

Note the seals (left) and penguins (right) on the ice.

During the first part of this century the extent of the ice break-out was of vital importance to the explorer, as his ship could go only as far south as the open water extended. But today's icebreakers can smash a way for miles, even through ice over 10 ft thick.





The Emperor penguins you see here are on the sea ice off Cape Crozier. They are mostly young ones guarded by a few “nurses”. These adult penguins are from 3 to 4 ft high and weigh up to 6 stone.

That ice cliff in the distance behind the penguins is about 100 ft high. It is the seaward face of a part of the Ross Ice Shelf (see Nos. 1, 5, and 6), and it stretches eastwards from here for 400 miles.

The ice shelf is steadily moving seawards, like a great glacier, and is in most places afloat. So the ice front changes its shape from year to year, and sometimes it is many miles further north than it is at other times.

It is not surprising that when Ross found this tremendous wall of solid ice blocking his way south he called it the “Barrier”. But in later years it was over the “Barrier” that Scott and Shackleton and Amundsen made their way towards the Pole, so the Barrier became the great white road to the south.

This is a very unusual photograph. The iceberg is ordinary enough, just a piece of the Ross Ice Shelf broken off and floating north. But the ugly blotch in the face of the iceberg is actually part of a great American station, Little America III, which was built on the surface of the Ross Ice Shelf in 1939. Gradually the snow covered the station, turned to ice, and, by 1957, Little America III was 25 ft down below the surface.

The writer was one of those who climbed down a shaft into the old station at that time and walked along the tunnels which in most cases were still intact despite the many feet of ice and snow overhead.

Slowly the ice shelf moved northwards, gradually more and more of it broke off as bergs, until at last a crack opened up right through the middle of the old camp as another iceberg floated out to sea: and there it is, part of the old station in the face of the berg, which is floating in the Ross Sea about 250 miles east of Cape Crozier, on 24 February 1963.

The black pole standing up above the ice towards the left of the picture was placed in position when the shaft was sunk down to the old camp in 1956.





That is what this pair of penguins could be saying as they prepare to hatch out their chicks. They have made their nest of stones, the only nest-making material available in the Antarctic, in an old box left behind at Cape Royds by Shackleton's party in 1909. It is a very sensible site for their nest, because sometimes in mid summer the temperature rises above freezing point and melting ice tends to swamp any low-lying nests. As a rule only two eggs are laid.

These are Adélie penguins. They are much smaller than the great Emperor penguins you saw in No. 7, and they are much more numerous. They are inquisitive and not at all afraid of human beings. Penguins cannot fly, but they are expert swimmers and divers, and can leap up from the water on to ice many times higher than themselves.

The antics of these little clowns of the Antarctic are most amusing, and men often spend hours watching them.

When all the available stones have been used by the "early birds", it is amusing to see the late-comers looking for a chance to steal stones from the nests of other birds in order to make their own.

A Weddell seal and her pup at Cape Royds. Doesn't Mum look proud and happy? No wonder; the baby seals are delightful little fellows. There is a seal rookery among the pressure ridges a few hundred yards from Scott Base (see No. 13), and one of the sights which all visitors to the base want to see is this colony of seals on the ice. Seals have a thick coating of blubber which protects them from the cold. Out on the ice they are ungainly and slow moving and generally seem to be fast asleep, but in the water they are very agile and are powerful swimmers.

It is necessary to kill a number of seals each year as food for the Scott Base dogs, but great care is taken to ensure that this does not cause any serious reduction of the seal population.

American and New Zealand biologists have made a careful study of the Weddell seals, and one discovery is that these seals can dive as deep as 1,500 ft in order to add the big bottom-dwelling fish to their menu.





This fine-looking bird is a skua. Something like a seagull in general appearance, the skua, the most common flying bird in the Antarctic, is much larger than our seagulls in New Zealand. This bird probably has a wing span of $4\frac{1}{2}$ ft, and weighs about 3 lb.

Skuas are unpopular with some people for two reasons: because they feed on the Adélie penguin eggs and chicks, and because they swoop down on men who intrude on their nesting grounds and sometimes give the intruder a good hard blow on the head with foot or wing. They are brave as well as handsome.

The skua's nest is simply a hollow scooped out of gravel on the rocky ground. There are generally two eggs, but only one chick is reared.

These birds are very powerful flyers, and skuas have been observed inland on the ice cap only 120 miles from the South Pole, easily the furthest south birds have ever been seen. Banded birds have been recaptured as far as 2,000 miles away from where they were banded.

The baby skuas are much more attractive little fellows than the darker and more cumbersome Adélie penguin chicks.

Down from the Polar ice cap, a vast field of ice about a mile thick and 2,500 miles across, completely covering all but the highest mountains near the coast, come many great glaciers, some of them the mightiest glaciers in the world. One, the famous Beardmore Glacier, was the dangerous white road up which Shackleton and then Scott slowly climbed from the Ross Ice Shelf to the Polar Plateau, seeking the Pole.

This one is the Priestley Glacier, named after R. E. (later Sir Raymond) Priestley, who has the unique honour of having served as a scientist-explorer with both Shackleton and Scott. The glacier is in northern Victoria Land and flows down in a south-easterly direction from the plateau to enter the Ross Sea at Terra Nova Bay, near where Priestley himself with his leader Campbell and four others lived through a terrible winter in 1908, sheltering in an "igloo" which they dug out of the ice.

The glacier is about 4 miles wide and 70 miles long. In December 1962 to January 1963 New Zealand exploring teams dog-sledged on both sides of the glacier and at its lower reaches north of Terra Nova Bay.





The Ross Ice Shelf is moving northwards slowly but steadily, at a speed which varies in different parts from 2,000 to 5,000 ft a year, towards the sea. Just south of Scott Base it comes up against the solid rock of Ross Island – and something has to “give”, so the ice trapped between the moving ice mass and the immovable land mass buckles and is forced up into all sorts of strange shapes, waves, and pinnacles and knife edges, such as you see here.

Visitors to the American base are usually brought across here to see these pressure ridges and the seals which in summer time lie basking on the ice.

Beneath the surface sometimes are fantastic caves which it is tempting to explore. Here and there too are cracks – baby crevasses – concealed by snow bridges. A New Zealand visitor once fell 9 ft down one of these, dislocating his shoulder.

In the distance is Mount Erebus, the active volcano which with its constant plume of steam is the outstanding physical feature of this whole area. Erebus was first climbed by six members of Shackleton’s expedition in March 1908.

During the 1964–65 summer the break-out was much greater than usual, and part of the pressure-ridge area moved in a westerly direction towards McMurdo Sound, but no doubt the pressure of the great Ice Shelf will again create the extraordinary ridges which have become a tourist attraction of the Antarctic.

One of the surprising things about the Antarctic is the existence of a number of areas, particularly in some of the valleys of Victoria Land to the west of McMurdo Sound, the Taylor, Wright, and Victoria Valleys, which are completely free of ice except for frozen lakes. The floor of such a valley is paved with gravel and sand, and surprised explorers sometimes hear the sound of running water.

It is not surprising therefore that geologists in particular find the dry valleys, as they are called, fascinating areas in which to work. Most of the rocks of Antarctica are buried beneath thousands of feet of ice, but here the scientists can examine them freely.





A true picture of Antarctica would include photographs of the surface of the Ross Ice Shelf and of the Polar Plateau. These would merely show a featureless white expanse of snow-covered ice.

So, instead, here are two views of the 50-mile-long Starshot Glacier, 6 or 7 miles wide, which cuts through the coastal mountains from the Polar Plateau to the Ross Ice Shelf 300 miles south of Scott Base. It was discovered by a New Zealand party in 1960–61.

THE MEN

16

Toehold on the Antarctic

The first men to live throughout a winter in the area which later became the Ross Dependency were the members of C. E. Borchgrevink's *Southern Cross* expedition at Cape Adare in 1899.

The first real penetration of the Antarctic Continent was made by Scott, Wilson, and Shackleton, who sledged south for 380 miles across the ice shelf in 1902-03 from Hut Point in McMurdo Sound. The 50 men of the expedition lived on the ship *Discovery*, but a big hut was built on Hut Point and this hut became a jumping-off point for many long sledge journeys. It was a refuge for several parties who could not go on to their huts at Cape Evans or Cape Royds till the sea ice had hardened.

From 1917 the hut was unvisited, as far as we know, until this United States helicopter flew in from the USS *Burton Island* in February 1947.





This is the hut at Cape Royds in which Lieutenant Shackleton (later Sir Ernest Shackleton) and his 14 companions lived from February 1908 till they were relieved on 1 March 1909. Shackleton had intended to winter on the ice shelf, near where Byrd's Little America was subsequently built, but was unable to effect a landing, so he returned to the McMurdo Sound area in the hope of wintering at the old *Discovery* winter quarters at Hut Point. However, the little *Nimrod* was blocked when still about 20 miles from Hut Point. The best site available was on Cape Royds and here the hut was erected. From here Shackleton and three companions sledged to within 100 miles of the South Pole.

To travel south Shackleton's men had to sledge over the sea ice off the western coast of Ross Island, to Hut Point.

This view shows how the whole area is dominated by Mount Erebus. The summit of Erebus is about 16 miles as the skua flies from Shackleton's hut, and it was from this hut that the first ascent of Mount Erebus was made by a party of Shackleton's men. Brocklehurst was badly frostbitten during the climb and had to have a big toe amputated in the hut.

When Captain Scott returned to the Antarctic in 1910, he too was unable to penetrate as far south in McMurdo Sound as he had done in 1902, but established his base on Cape Evans, between Cape Royds and Hut Point. Here was erected a large building, 50 ft long, probably the most historic site in Antarctica. From here, during the winter night of 1911, Wilson, Bowers and Cherry-Garrard set out on "The Worst Journey in the World", to the Cape Crozier Emperor penguin rookery, and from here Scott himself began the great journey to the Pole from which he never returned.

Some years later the hut was occupied between 1914 and 1917 by members of the Ross Sea component of Shackleton's Trans-Antarctic Expedition, who were marooned here when the *Aurora*, on which they planned to live, was driven out to sea in a blizzard. Three of the 10 men left here lost their lives.

The hut became filled with ice, but was excavated by a party of New Zealanders in 1960-61 and carefully restored as you see here to the condition it was in when it was the home of Scott's last expedition. The huts at Hut Point and Cape Royds have also been restored.





When Dr Fuchs planned to cross the Antarctic Continent from the Weddell Sea to the Ross Sea in 1957–58, he asked a team of New Zealanders under Sir Edmund Hillary to lay depots from the Ross Sea end to assist the crossing party.

1957 also saw the commencement of a world-wide scientific research programme, the International Geophysical Year or IGY, during which a five-man New Zealand team was to work in the Antarctic.

So it was decided to build a base, Scott Base, which would accommodate both parties. Dr Trevor Hatherton, Lieutenant Commander W. J. L. Smith, and Bernard Gunn accompanied a United States expedition to McMurdo Sound, to select a site for Scott Base.

It was thought that a spot at the foot of the Ferrar Glacier might be suitable, and the New Zealand team, in order to see if it would be practicable for Fuchs to descend the Ferrar with his big snocats, made an ascent of the glacier, as Scott, Lashly, and Evans had done on the first western journey in 1903. Like them, Hatherton's team manhailed their sledge. Here is their New Zealand flag flying at the foot of the glacier.

Scott Base was finally built on a low rocky cape called Pram Point which stretches south from the Hut Point Peninsula, the southernmost tip of Ross Island. From Hut Point itself and the American McMurdo Base it is reached either by rounding Cape Armitage on the sea ice or by a 2-mile journey over the Gap, a low pass between Observation Hill and Crater Hill.

Scott Base today consists of 10 buildings grouped together and connected by covered ways, tunnels of corrugated iron which make it possible to move from hut to hut without going outside. There are several other buildings further afield.

The main covered way can be clearly seen running through the centre of the base.

Described by many experienced visitors as one of the finest bases in the Antarctic, Scott Base provides comfortable living for the 14 men who normally live here during the five-months-long winter night. During the summer months there may be up to 50 men at the base, and the living quarters are somewhat crowded. But the atmosphere of interested effort and genuine good fellowship which pervades the base makes it always a pleasant place in which to live.





Scott Base is surrounded by natural beauty and by places which bring back the memory of valiant deeds. In this air view, for example, on your left are the famous pressure ridges and the sea ice, and beyond, the Ross Ice Shelf. In the middle distance rises Observation Hill, surmounted by a great cross of jarrah in memory of Scott, Wilson, Bowers, Oates, and Petty-Officer Evans, who all died on the return journey from the Pole, which they reached a month after the Norwegian, Amundsen, on 16 January 1912.

Between Crater Hill (out of sight to the right) and Observation Hill is the Gap, leading, in 1902–03, to Winter Quarters Bay and the frozen-in *Discovery*: today, to the big American base, McMurdo, with its dozens of buildings, its church, its store, and on the side of Observation Hill, its atomic reactor.

And in the distance, across McMurdo Sound, are the western mountains, their highest peaks challenging our New Zealand Southern Alps for loftiness and grandeur.

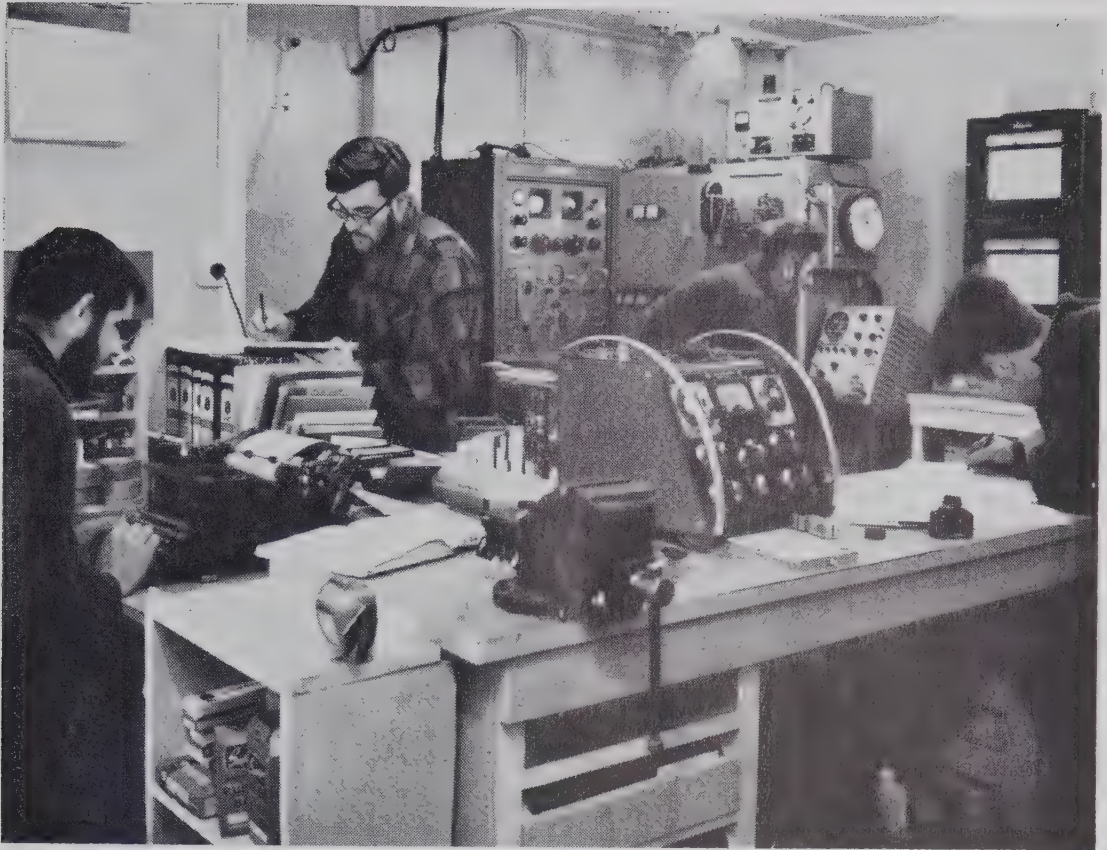
McMurdo Sound here is about 30 miles across. Note the ice edge, where the open sea and the remaining sea ice meet. Much more ice may break-out before the summer ends, but only rarely does it disappear in front of Scott Base.

From the earliest days of Antarctic exploration men of science have been prominent among those who have gone south. Below, you see two scientists at work under primitive conditions in Scott's old hut at Cape Evans, in 1916. The photograph opposite shows New Zealand scientists in the well equipped laboratory at Scott Base.

Much of the scientific work at Scott Base itself concerns the upper atmosphere. The Antarctic is an ideal place from which to observe the interaction between the earth's magnetic field and electrically charged particles from the sun or even from outside the solar system. Among the factors responsible for this interaction is the layer of the atmosphere called the ionosphere, from 50 to 200 miles above the earth. Among the phenomena resulting from the interaction are the *aurora australis*, the Southern Lights, which shimmer in the winter darkness, and the strange radio sounds called "whistlers": a New Zealand scientist was the first man to hear these sounds in Antarctica. Sometimes disturbances due to one or other of these factors are so severe that all radio communications are blacked out and all aircraft grounded. This one instance may help you to see why the study of upper atmosphere physics is of great practical importance.



Yesterday



Today

At all Antarctic bases, records are kept of weather conditions. These enable the meteorologists to give us much more accurate forecasts of our own weather. Other men are concerned with seismology and geomagnetism.

Out in the field, the geologists' scope is limited by the ice cover but outcrops of rock are carefully studied and samples taken back for laboratory examination. Coal seams and plant fossils tell of a much warmer climate in times gone by, and the day may come when the valuable minerals of which traces have been found may be used to benefit mankind. Glaciologists examine the structure and movement of the ice (see No. 30). Meanwhile the biologists are studying the penguins, the skuas, the seals, and the tiny insects which have been found as far south as only 300 miles from the Pole; while the oceanographers are examining the teeming life in Antarctic seas and discovering the shape of the ocean bottom.

The Antarctic is a unique laboratory and life on this earth may be greatly altered in years to come by the work of these men who wrestle with the secrets of the great white south.

For many years dogs, huskies, provided the most reliable form of polar transport. Amundsen used a large number of dogs and returned from the South Pole safe and well. Scott relied partly on dogs, but more on ponies and motor sledges, and finally man-hauling: he and his companions died on the return journey.

Today many countries engaged in Antarctic field work use no dogs at all, relying entirely on mechanical transport: aircraft, snocats, weasels, motor toboggans, etc. But New Zealand's Scott Base still has a dog population of about 40, as well as many motor vehicles. For some kinds of field work dogs are still considered more dependable than, say, motor toboggans; and for search and rescue work in rough country nothing equals the dog team.

Men become very fond of their dogs and welcome their companionship on long and anxious journeys. But it is unlikely that in the future there will be more than a few teams retained even at the dogs' last stronghold, Scott Base.



INTO THE FIELD

25

The New Way



The coming of the air age to Antarctica has not made dog-sledging obsolete. But it has made it unnecessary for geologists, surveyors, and others interested in carrying out research work far away from any established base to make long, possibly dangerous, and certainly time-wasting journeys right from the base to the field of operations.

By using planes and, for fairly short journeys, helicopters, it is now quite easy to transport the men and their dogs and sledges to some suitable spot in the vicinity of the area in which they want to work. Here you see two members of a New Zealand field party, in November 1961, loading a husky on to a United States R4D-8 aircraft at McMurdo. Men, dogs, and sledges were flown 500 miles to the head of the Mill Glacier, a tributary of the Beardmore Glacier which Shackleton discovered and sledged up in 1908.

Here they were only 300 miles from the South Pole, the temperature fell to -35°F (in summer), and all the men were slightly frostbitten. But here and not at Scott Base they began the long and arduous sledge journey ahead of them, with their strength therefore unimpaired.

This American plane has landed safely on the rough surface of the ice cap which covers all but the high peaks of the inland area which the New Zealand surveyors and geologists want to examine. The propellers are kept turning while all hands work fast to unload the dogs, the sledges, the stores (for perhaps several months), and the equipment which the explorers need to carry out their work.

Here a dump is made. Everything has been carefully packed at Scott Base in boxes which can be handled as easily as possible and yet which are strong enough to stand up to the most violent blizzards. These may strike at any time with very little warning in spite of the efforts of the meteorologists to provide reliable forecasts of the weather which can be expected.

As soon as everything is unloaded on to the snow-covered ice the aircraft takes off again on its flight back to McMurdo while the field party of perhaps four or six men prepares its base camp.

In recent years motor toboggans have largely taken the place of dogs for field work, but most New Zealand field-party men like the companionship of the dogs and several dog teams are still maintained at Scott Base.





Every field party has its own problems. This New Zealand party has completed the base camp, where it was “put in” by air, and has split up into two sections each with a team of nine dogs. This particular section has been away from the “put-in point” for several days and is now carrying out survey and geological work in a mountain range which projects several hundred feet in places above the snow surface. The ice covering all the lower land hereabouts is known to be over a thousand feet thick. It has been measured in places by seismic soundings carried out by an earlier party which made a traverse through this general area a few years ago.

All field parties keep in contact with each other and with Scott Base by portable radio sets. These men have received warning of an approaching storm, and are hurriedly erecting their polar tent, piling snow on the flaps for greater safety, and are putting all their gear into the tent or in compact piles so that nothing will be blown to the horizon when the blizzard starts. They are just in time. When the blizzard really rages a photograph would show nothing.

A blizzard may blow continuously for many days, and all this time the men will be pinned to their tents. As flying in a blizzard would be quite impossible, a field party may run rather short of food during a prolonged blizzard.

A surveyor's work is liable to be arduous at times, even in a temperate climate like that of New Zealand. But in the Antarctic, especially far to the south, or on the Polar Plateau to the west, of Scott Base, his work is always arduous, sometimes extremely rigorous and even dangerous. Here, even in mid summer, the temperature never rises much above freezing point (32°F) and may sink rapidly to below zero. Setting up the theodolite becomes a difficult task, and handling the knobs and screws is a painful process. Gloves must be worn because if the bare hand touches metal, the skin sticks to it and the hand can only be removed by tearing off a layer of skin. Yet manipulating the delicate instrument is almost impossible when the hand is in a heavy woollen glove. So the surveyor has to be on the spot and ready when the temperature is reasonably high.

Almost equally trying is the task of the man with the notebook who is writing down the figures as the surveyor calls them out to him.

As a result of the devoted work of men like these New Zealanders, the whole of the Ross Dependency not buried deep under the ice cap has been accurately mapped.





The Antarctic is an ice man's dream: he has 90 per cent of the world's ice to study. Here we see a New Zealand glaciologist going down into the pit which he has dug 20 ft deep in the McMurdo Ice Shelf (an arm of the great Ross Ice Shelf, which is itself as big as France).

At various depths he will take the temperature and measure the pressure on the walls of his pit caused by the movement of the ice shelf down towards the sea. He will note the layers of summer and winter snow. They will show him how much snow has fallen in, say, a year. By noting the number of layers he will be able to tell in which year the snow fell at any given depth. At the bottom of this hole for instance the snow fell in the year 1942. He will weigh blocks of snow in order to discover how much air is still trapped in them; in other words, how far the snow has turned into ice.

He will also take samples of snow back to New Zealand for laboratory examination to measure the debris released in the atmosphere by the explosion of atomic bombs thousands of miles away and to answer many other important questions.

It is not always possible for men in the field to “lie up” throughout a blizzard. A blizzard can last for days, and there are, for example, the dogs to be fed.

This photograph was taken during the later stages of the journey which was illustrated in photograph No. 25. This day, though, is not one for travel. These New Zealanders are wearing string singlets (to ensure a layer of warm air against the skin), warm woollen underwear, strong pants, three or four pairs of woollen socks inside their massive boots or sometimes mukluks, outer garments, with a hood called an anorak, made of light but strong and wind-proof material, double gloves, and goggles.

Even so, when they crawl into their tent, their faces will be almost covered with a mask of ice, and their beards will be white. They will be lucky if they have escaped being frostbitten.





Here is a crevasse, the greatest danger which faces the Antarctic explorer. This particular crevasse is on the Axel Heiberg Glacier, one of the ice rivers which descend from the South Polar Plateau through mountain passes to the Ross Ice Shelf 600 miles south of Scott Base and only 300 miles from the Pole. The man shown here was one of the New Zealand team referred to in No. 25. He is trying to pick out a route which the dogs and sledge can come down.

This crevasse, dangerous as it looks, and is, is not the worst kind, because you can see it. The greatest danger is the crevasse which is covered by a bridge of snow and so is impossible to detect except by careful probing of the surface. Many explorers have fallen through the "lid" of a small crevasse and have saved their lives by holding out their arms. Others have fallen down to the length of their sledging harness and have then been pulled up by their companions. But some have gone down to unknown depths and their doom. In 1959 a New Zealand snocat, a big over-snow motor vehicle, fell 100 ft into a crevasse. One man, Lieutenant Tom Couzens, was killed and the two others badly injured.

In country where crevassing is likely, most men prefer a dog team to any form of motor vehicle because if the lead dogs go through a snow bridge and are hanging in their harness they can be drawn up to the surface, whereas a toboggan would plunge into the depths of the crevasse.

In the Antarctic today every possible precaution is taken to avoid accidents, but it is a rugged land and sometimes to carry out an important task risks have to be taken.

This American Dakota plane had landed safely at 5,000 ft on the Polar Plateau at the head of the Davis Glacier. A party of New Zealand explorers with the motor toboggans they had been using were picked up for return to Scott Base. When the plane had taken off and was about 30 ft off the ice runway, it stalled and the port wing dug into the snow, digging a long scar in the runway before the aircraft settled at right angles to the line of flight with JATO (jet assisted take-off) bottles flaming and petrol trickling on to the snow. Providentially, the 30 degrees of frost prevented the petrol from igniting.

Pieces of shattered engine and ski undercarriage were widely scattered, and wings and fuselage were torn: but this time no one was hurt.

In other aircraft crashes many lives have been lost. Near Cape Hallett, in October 1958, a Globemaster struck a hillside and all six occupants of the lower deck were killed.





After three months of dog-sledging in the mountains of Southern Victoria Land, engaged in geological work, and surveying previously unexplored country, this New Zealand team has been brought back the 450 miles to Scott Base by air. The smiles on the bearded frost-bite-scarred faces of the four men show how happy they are to be back in the comfort of a well equipped permanent base after the rigours of sledging in rugged and dangerous country. Their next engagement will probably be to have their first bath for many weeks, but they will have to take turns and hope that there is enough water for all four of them. As all the water for cooking, drinking, washing clothes (and washing men) has to be obtained by melting snow laboriously loaded into a snow weasel and brought in from a "safe" site about a mile away, water is a scarce and valuable commodity at Scott Base.

In the background of this picture is part of the well stocked Scott Base library. It contains a wide assortment of novels and magazines, changed from year to year. Naturally there is a large section devoted to books written by previous Antarctic explorers.

By about the end of February, the summer parties will have left for New Zealand, and the winter party of 13 or 14 settles down to making everything shipshape before the sun disappears, not to be seen again until August. The nights are already becoming longer and there is soon not much daylight to permit outside work to be done.

But right through the long dark months, with the thermometer falling to -50°F (82° of frost), there are tasks which must be carried out: the dogs to be fed, the snow for water to be collected and brought in, and, as you see here, the "roads" to be bulldozed clear of accumulated snowdrift.



If you want to know more

ABOUT THE ANTARCTIC

here are some books which you should be able to obtain in a good bookshop:

Antarctica, by A. S. Helm and J. H. Miller. The full story of New Zealand's part in the Trans-Antarctic Expedition.

South, by G. Billing and G. Mannering. An account of the Antarctic today, with over 200 fine illustrations, many of them in colour.

Arctic, by G. Billing and G. Mannering. An account of the Arctic today, with the field.

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